NEW DISCOVERIES ALL OVER THE EARTH

What the VERMIFORM APPENDIX Was Made For

Recent Interesting Scientific Experiments Indicate That the Function of This Mysterious Duct Is to Regulate Our Bowels

MANY people have wondered what the vermiform appendix was really made for, arguing quite reasonably that such a distinct part of the human anatomy could not have come into existence without some important purpose.

The usual answer of the surgeons has been that the only use of the appendix is to give them employment. It is removed at the slightest sign of trouble, and some people, impressed with the doctors' statement that it is of no use, have even had it removed when there was nothing the matter with them.

Medical science has at last furnished a reasonable explanation of the use of the appendix. Dr. Edmond Perrier, of the Paris Academy of Sciences, and several doctors associated with him, report that as the result of a long series of experiments they have found that the purpose of the appendix is to regulate and stimulate the bowels.

The normal human appendix, according to these experiments, secretes a fluid which directly stimulates the contractile movements of the walls of the intestines, producing what we call movements of the bowels. The contractions do take place in the absence of this fluid from the appendix, but the fluid is necessary to the most vigorous and perfect movements.

We all know that insufficient action of the intestines is one of the greatest causes of ill health in modern life. These experiments indicate that a bad condition of the appendix or its absence may keep the intestines from working properly.

Having noted several facts that suggested this explanation of the importance of the appendix, Dr. Perrier and his associates tested it by experiments on animals. The monkeys and rodents (including rats) are furnished with an appendix resembling man's.

The French doctors began their experiments on monkeys. In their first experiment they took twenty-four monkeys of about the same age. They were all young and in good health.

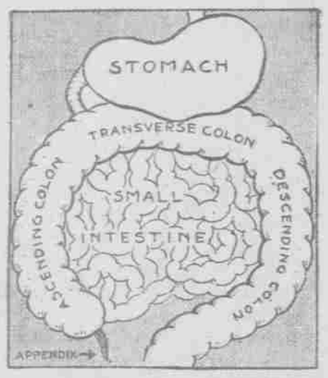
The doctors removed the appendix from twelve of these animals. The operation was very quickly performed under anaesthetics and within twenty-four hours the animals were running and feeding as usual.

The scientists then kept all the twenty-four monkeys in separate cages with runways for each, so that they could watch the changes in health. Every monkey received exactly the same kind and amount of food.

From the first the doctors noticed a marked diminution in the activity of the intestines of the monkeys that had their appendices removed. At the end of one week there was such a marked deficiency in elimination of waste material by the operated animals that their health was seriously affected. They became dull and listless and ceased to run about in the manner natural to monkeys. Their hair fell out, their eyes were discolored and their tongues were coated with fur.

The change was noted in every one of the twelve operated animals. It therefore could not have been due to accident or to the weakness of any particular monkey. The twelve unoperated animals remained in perfect health, and their intestinal activity was excellent. It therefore appeared certain that the change in condition was due to the removal of the appendix.

It is important to note that a monkey does not depend on the contractile movements of the walls of his intestines as much as a man does. In man, the food, after passing from the stomach into the small intestine is obliged to pass upward into the ascending colon



"Our food passes from the stomach into the small intestine, and then upward through the ascending colon, which is the beginning of the large bowel. The appendix, located at the lower end of the colon, secretes a fluid which has an important effect on the necessary contractile movements of the intestines."

against the force of gravity. A man is therefore entirely dependent on the contractile movements of the walls of his intestines for their proper action. Gravity cannot do the work. This peculiarity is due to the upright position man has assumed in the course of evolution.

The position of the human appendix may be briefly explained. At the lower opening of the stomach the small intestine, in which much of our digestion takes place, begins. This changes into the large intestine, so called from its large diameter. The beginning of the large intestine is in a pouch called the caecum. At the bottom of the caecum is the little blind tube we call the vermiform appendix.

From the caecum the food must be forced upward through the ascending colon for about ten inches, then across the width of the abdomen and then down again. Hence it is clear that if the intestines are sluggish there must be great congestion around the caecum and appendix.

In animals that run entirely or usually on all fours the food does not have to pass up into an ascending colon, but almost entirely in a lateral direction. Moreover, the great activity of the animal helps to empty the intestines.

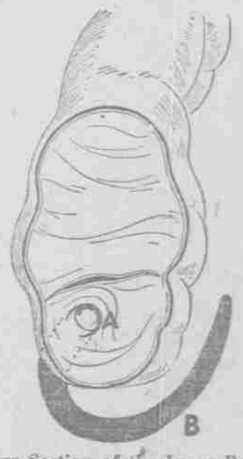
The French doctors then made a fresh series of experiments to show that the changes in intestinal activity were directly due to the appendix. They removed the appendix from one of the healthy monkeys, prepared a serum from it and administered this to one of the monkeys without an appendix. The administration was followed by an increased activity of the intestines.

A section of the colon of a monkey was removed and the appendix serum placed in contact with it so that changes could be watched through a small window. As soon as the liquid touched the surface of the fresh colon wall strong contractions of the tissues could be noted.

In these experiments six of the monkeys with appendices and six of those without appendices were killed, leaving six with and six without. In a period varying from six weeks to four months, three of the monkeys without appendices died a premature death. The other three were kept alive by appendix serum. This was proof that the premature death of the three monkeys was due to the lack of appendix secretion.

The six monkeys that had never been operated on remained alive, and well at the end of the four months, eating their ordinary food.

It was thus proved by a number of different experiments that the appendix performed an important function in keeping up the activity of the intestines. The experiments have been laid before the Paris Academy of Sciences, and excited great interest among the French medical profession.



Cross Section of the Large Bowel, Showing the Little Opening (A) into the Appendix (B).

A layman is likely to observe that he has known of many cases where the removal of the appendix was not followed by premature death, as occurred in three of the monkeys, or by any very serious consequences. It must be remembered that man has many resources for protecting himself against inactivity of the intestimes which the monkey does not have. When an important function of the body is stopped the animal body has little or no power of protecting itself against the change or accommodating itself to it. Man is remarkable among the animals for his power of resisting disease and unhealthy conditions.

The great lesson of the experiments for man seems to be that he should aim to keep his appendix in good condition in order that it may perform its proper functions. The removal of the appendix cannot be regarded as a perfect cure for appendicitis, as it usually is regarded by surgeons and most laymen. In future it is hoped that doctors will strive more earnestly to save the appendix and make it do its natural work instead of snipping it off at the first sign of trouble.

Why We Should All WALK LIKE FARMERS

WALKING is not only the easiest of all exercises to take, but physicians say it is the most beneficial. In spite of the fact that we begin walking in infancy and walk thousands of miles before we die, we really know very little about this common form of locomotion. Until the advent of the motion pictures, for example, it was generally supposed that man had only two natural means of moving himself from place to place—walking and running. But the films have taught us that in between the two forms of locomotion there comes a third, which may be called the heel-and-toe walk. This resembles neither walking nor running, but acts as a kind of bridge between the two gaits and has an entirely different effect on the anatomy.

Even in walking proper every one does not walk in the same way. According to Dr. Felix Regnault, a French scientist, who has been investigating the subject, the farmer has a very different walk from the city man. The latter usually takes short steps, body held upright, and the knee completely straightened, while his heel taps or smartly strikes the pavement before the rest of his foot. The countryman, on the other hand, takes a longer stride, leans forward, keeps the knee bent, and slides rather than strikes his foot on the ground, so that he leans his weight upon the whole sole of the foot rather than on the heel only.

Each of these modes of progression has its uses; but the countryman's way of walking enables him to cover a much longer stretch of ground without fatigue, provided the road be fairly even. When the surface is much broken, we generally find him reverting to the short steps of the city dweller.

The pace attained in the walk has also much to do with the gait. A man of average height, with neither abnormally short nor crooked legs, ought to be able to accomplish three-and-a -half miles an hour on a level road without fatigue. This, as the motion pictures show, implies about sixty-five steps to the minute. If he increases the number of steps by ten, he will increase the distance travelled within the hour to nearly four miles, but at a vastly increased expenditure of energy. To do this, he has to shorten his stride, and if he pushes this shortening so far as to take more than seventy-five steps to the minute, he will find that the distance he traverses in a given times lessens instead of increases.

In order, therefore, to accomplish more than four miles an hour another gait has to be adopted —what we call the "heel-and-toe" walk

This is distinguished from the true or natural walk in that, while in this last both feet rest on the ground simultaneously and for an appreciable length of time, in the first-named the toes of the hinder foot only just touch the ground at the moment when all the weight of the body is thrown on the foot in front. If it goes beyond this, and if the toe of the foot behind leaves the ground before the heel of the one in front has received the weight of the body, the action changes from a walk into a run, and if this takes place in a walking race the walker is disqualified. Yet Dr. Regnault says that the transition is so quick as to be extremely hard for even the trained eye to detect.

There can be little doubt as to the comparative value of the two gaits as an exercise. The true or natural walk exercises not only the muscles of the legs and feet, but also those of the trunk and abdomen, thereby increasing the peristaltic action of the muscles and helping to avert corpulence. At the same time, it increases the circulation of the blood, and probably stimulates the action of the liver, without putting any extra strain on the heart and lungs. As a natural mode of locomotion it accomplishes its purpose with less expenditure of energy than any other possible to man.

The moral of all this is, that if any one wishes to walk for exercise as distinguished from breaking records, he should first cultivate the countryman's walk with bent knees and body leaning forward, and then find out his own natural pace and stick to it.

Odd New Facts About SLEEP

THE majority of mankind sleep lying upon the right or left side of the body, and with the knees drawn up toward the chin. Certain African tribes, however, lie upon the back, with the back of the neck resting on a bar of wood supported on two short pillars.

The elephant apparently invariably, and the horse commonly, sleep standing. This is really astonishing. Apart from the apparent difficulty of maintaining the balance of the body during these long periods of unconsciousness, one would have supposed that a recumbent posture, in the case of both these animals, was imperative. Cattle and their kin commonly sleep lying down, and during many hours of the day they lie down, as when chewing the cud.

More curious still, bats and other creatures invariably sleep hanging head downward, suspended by their hind feet. The same strange habit is common to the little hanging parrots of India and the Malayan region. In this they differ from all other birds, which invariably sleep with the head turned tail-ward over the back and the beak thrust in among the feathers between the wing and the body—not under the wing, as is commonly believed. This strange habit is followed even by the penguins, wherein the feathers are so short as to fail completely to cover even the beak. Owls are, perhaps, the only exception to the rule. And, by the way, the only other animals which thus turn the head backward after this fashion during sleep are certain peculiar tortoises known as "side-necked tortoises."

Long legged birds, like storks and gulls, sleep while resting only on one leg. Ducks generally sleep on open water. And to avoid drifting shorewards, and therefore into the danger zone, they keep constantly paddling with one foot, so that the body is always circling round the chosen sleeping-area. The sloths sleep suspended by their feet, and the head tucked in between the forelegs. The no less remarkable African pottos, or slow-lemurs, assume a similar pose, but they attach themselves to a vertical, instead of a horizontal, bough, so that the body rests with the head upward. No animal, save man, sleeps upon its back.

As a rule, darkness induces sleep. With many animals, however, the reverse is the case—as with the bats and owls. This reversal of the usual order has been brought about by the nature of the feeding habits.

The question where sleep begins is by no means easily answered. One is inclined to draw the line at the insects. But since all living things, plants as well as animals, display periodical states of quiescence, perhaps we shall be near the truth in regarding sleep as universal among living things. In the case of plants, it is enforced by darkness, save in the case of many bacteria and fungi, which, like evil deeds, grow under the cover of darkness.

Why a STRENUOUS LIFE Can't Make a Normal Man INSANE

PEOPLE should be discouraged from marrying into families that have any taint of insanity or serious diseases. In mating, we should watch out for the mental and moral peculiarities, for these are the things most likely to be transmitted. Physical defects are not so important, says Dr. Woods Hutchinson, the popular writer and lecturer on medical subjects.

Insanity is now generally believed to be inherited. In a small proportion of the cases where the derangement is temporary, it is due to some sudden shock or injury. In such cases where it is not due to any inherited peculiarities it is usually curable.

One-seventh of the population used to die from consumption; now about one-tenth die, and more than three-tenths suffer from this disease. Not more than one-third of one per cent of the population is insane, and so insanity is not nearly so serious a problem as tuberculosis.

Among the ancestors of insane people we find traces of feeble-mindedness, idiocy, inebriety and religious mania. Unnecessary piety is one of the chief causes for insanity, and alcohol comes next. An habitual drunkard may not be insane, but his predilection for alcohol is a sure sign of some defect in his nervous system, which may develop into insanity in his children or their children.

Heredity accounts for about fifty per cent of the cases of insanity. This is encouraging. It shows that the shocks and conditions of modern life do not make people insane; the strenuous life merely brings out the insanity that is latent in some persons as a result of heredity. A normal person cannot be driven insane by any of the conditions of modern life.

Ninety-eight per cent of the community are born under such favorable circumstances that no untoward conditions can unbalance their mental make-up. The other two per cent are individuals who may become insane if conditions are unfavorable, but at least two-thirds of this two per cent can be saved by proper care and protection.

Many people born with a tendency to insanity go through life without ever exhibiting any traces of mental weakness, because they never experience any shock or nervous disturbance sufficient to bring it out.

Insanity ought to be a good ground for divorce, yet in some of our States, and in England, divorces are not allowed for this cause. The reason for this is a good example of the absurdity of much so-called legal logic. According to the law, an insane person is irresponsible and cannot undertake his own defense in a suit, therefore the court assumes that the insane person is non-existent, and refuses to entertain the proposition of divorce from him or her.

A Way to CHEAT JACK FROST

A SCIENTIFIC plan that will cheat Jack Frost of the millions of dollars' worth of crops he ruins, and singe his toes into the bargain, is proposed by Professor Alexander McArdle, of Harvard University, who has already proved the idea a success by a series of practical tests in the fruit-growing districts of California.

Professor McArdle proposes to trail Jack Frost just as a detective trails a criminal. When frost threatens a region, warning will be sent by telegraph, and the farmers will be instructed how to protect their crops so that by the time the frost arrives they will be safe from harm.

This protection will be supplied by the liberal use of crude oil burned in huge pans throughout the threatened section. The expense, Professor McArdle says, of raising the temperature in this way sufficiently to check the ravages of the frost will be small compared with the value of the crops saved.

"Inside of five years we will be in a position, through service furnished by the Blue Hill station in Hyde Park, Mass., to protect every crop in New England from the ravages of frost," says the professor. "It is my hope to render practical service to the community. Inside of twenty years we will be able to predict accurately the coming of rain."

In anticipation of severe frosts next year the cranberry growers of Massachusetts are seriously considering the adoption of the plan proposed by Professor McArdle, despite the fact that the service will not be in operation for some time. They have great confidence in the predictions of the scientist that soon no farmer need fear the coming of frost.

YOU MIGHT TRY--

Massaging Your Gums.

IT is an excellent plan to massage the gums gently with a dry and not too stiff tooth brush every day. This improves their circulation and keeps them firm and healthy.

To Clean Fur Rugs.

A FUR rug can be cleaned by throwing it fur downward on a very wet or snowy grass plot or a piece of wet burlap. When the fur is well moistened hang on a line, beat lightly on the wrong side, and then brush the fur in the right direction.

When It's Damp.

A FEW drops of oil of lavender sprinkled on the shelves of your bookcases and closets will dispel the odor of mold which frequently arises from damp weather.

To Remove Mud Stains.

CARBONATE of soda will remove the most obstinate of mud stains. Rub off with a cloth or flannel dipped in the soda, then press the wrong side of the fabric with a hot iron.

Do We Want to KNOW THE TRUTH?

THE bitter controversies which are constantly raging in the scientific world, give ground for the belief that even the most advanced thinkers do not really want to know the truth—at least, not the whole truth. It seems to be natural for the human mind to set for itself certain limits beyond which it is disinclined to go. This is why the very scientists who are to-day loudest in their indorsement of some new theory may to-morrow be denouncing as absurd some alleged discovery that is far less novel.

The late Mark Twain, whose philosophy is as sound as his humor is entertaining, sums up this astonishing trait of human nature as follows:

"We are always hearing of people who are around seeking after truth. I have never seen a permanent specimen. I think he has never lived. But I have seen several entirely sincere people who thought they were permanent seekers after truth. They sought diligently, persistently, carefully, cautiously, profoundly, with perfect honesty and nicely adjusted judgment—until they believed that without doubt or question they had found the truth. That was the end of the search. The man spent the rest of his life hunting up shingles wherewith to protect his truth from the weather.

"If he was seeking after political truth he found it in one or another of the hundred political gospels which govern men on the earth; if he was seeking after the only true religion, he found it in one or another of the three thousand that are on the market. In any case, when he found the truth he sought no further; but from that day forth, with his soldering iron in one hand and his bludgeon in the other, he tinkered its leaks and reasoned with objectors. There have been innumerable seekers after truth—have you ever heard of a permanent one? In the very nature of man such a thing is impossible.

"I have said that there are none but temporary truth-seekers; that a permanent one is an impossibility; that as soon as the seeker finds what he is thoroughly convinced is the truth, he seeks no further, but gives the rest of his days to hunting junk to patch it and caulk it and prop it with, and make it weatherproof and keep it from caving in on him. Hence the Presbyterian remains a Presbyterian, the Spiritualist a Spiritualist, the Democrat a Democrat, the Republican a Republican, the Monarchist a Monarchist; and if a humble, earnest and sincere seeker after truth should find it in the proposition that the moon is made of green cheese, nothing could ever budge him from that position; for he is nothing but an automatic machine, and must obey the laws of his construction.

"And so, having found the truth, perceiving that beyond question man has but one moving impulse—the contenting of his own spirit—and is merely a machine and entitled to no personal merit for anything he does, it is not humanly possible for me to seek further. The rest of my days will be spent in patching and painting and puttying and caulking my priceless possession and looking the other way when an imploring argument or a damaging fact approaches."

Why DIRTY CITIES ...re BAD for the EYES

THI... results which may follow getting even the tiniest cinder into your eye form one of the strongest arguments for the necessity of keeping cities as free as possible from smoke and dust. So important does the American Medical Association consider the matter of cinders that it has seen fit to issue a special bulletin on the subject.

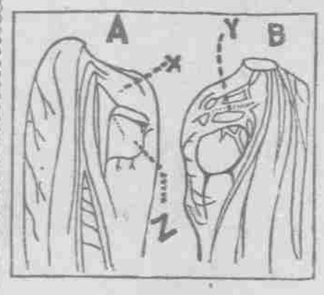
"While getting a cinder in your eye may seem a trivial mishap," says the association's bulletin, "and often is if it is immediately removed from the eye, yet it is often a most serious thing, and the public at large little realize that a seemingly unimportant accident of this sort may result in serious harm.

"The membrane covering the eyeball is a very delicate structure, and when ever a tiny speck of any foreign substance lodges there it quickly becomes imbedded. The irritation thus set up causes the person to wink the eye frequently, and each time the lid closes, rubbing against the particle, it tends to imbed it still further into the membrane. The efforts of sympathizing friends to remove the offending speck with a handkerchief or a wooden toothpick, instead of helping the situation, usually results in making a bad matter worse from the damake thus done to the tissues. Infection is then carried into the tissue, and an ulcer results.

"If the process reaches this stage, even if the cause should be completely removed, it would be too late to prevent a scar after the ulcer heals. It might be so faint as to be hardly distinguishable, yet if it is situated just in front of the pupil, as very frequently happens, the vision of that eye would be seriously impaired.

"Having the streets washed every night instead of swept during the day and prohibiting the use of soft coal would go a long way toward remedying this evil."

How LOCUSTS MAKE MUSIC with Their WINGS



A Diagram of the Locust's Wings, with Which He Makes Music to Call His Mate.

THE chirp of the grasshopper and the singing of the locust have long been the puzzle of entomologists, for they know that these insects have no vocal chords with which the singing could be produced, and it seemed to be a real singing tone. At last it has been ascertained that locusts and grasshoppers are able to emit sounds so much like those of the human voice because their wings are constructed like a violin and produce musical notes when one is rubbed against the other.

Here are diagrams of a locust's wings, showing the way he produces his characteristic tones. The picture marked A is the right wing, showing the ridge (X) which is rubbed against the left wing B, with the serrated or saw-like edge (Y). The membrane marked Z helps in the making of the sound by serving as a sounding board, so that the rasping of the saw edge on the straight edge "carries."

Entomologists have raised the question: Why does the grasshopper chirp or the locust sing? The answer is very simple. The singing apparatus appears only on the males, and there is good reason to believe that the chirping and singing are for the sole purpose of attracting or charming the females. This singing is to these insects what the gay plumage of the male pheasant or bird of paradise is to those species, a means of attracting the other sex and winning favor.

Another interesting theory as to the boring beetle sets aside the well-cherished and ancient superstition that the noise this beetle makes, called the "death-beat," presages misfortune. The scientists say that it is only the method adopted by the male beetle to notify the female buried in the wood that he is boring his way in. He is knocking, as a person would at a door, and boring in at the same time.